

THE TREATMENT OF CONGENITAL AND ACQUIRED LUXATIONS AT THE SHOULDER IN CHILDHOOD.¹

BY ROYAL WHITMAN, M.D.,

OF NEW YORK,

Associate Surgeon to the Hospital for Ruptured and Crippled.

It is of interest to note that while congenital dislocation at the hip, a misplacement present before birth, is relatively common, congenital dislocation at the shoulder in this sense is very uncommon.

In the great majority of cases, it is an acquired rather than a prenatal disability, that perhaps might be better described as a deformity of the arm than a dislocation of the humerus.

This group of cases may be divided into three classes:

1. True congenital misplacement of the humerus.
2. Dislocation caused directly by violence at birth.
3. Acquired subluxation, due to injury of the brachial plexus.

Cases of the first class are very uncommon, and are therefore relatively of little importance.

Cases in the second class are relatively uncommon also. The dislocation in these cases is apparently caused by traction on the arm at delivery, or by swinging the child by the arms in attempts at resuscitation. In most instances there is injury to the brachial plexus as well.

In the third, and numerically by far the most important class, there is no primary displacement, and the subluxation found in later years can be classed as congenital only in the sense that it is induced by injury at birth.

The sequence is somewhat as follows. In cases of obstetrical paralysis, the injury to the brachial plexus caused by trac-

¹ Read before the New York Surgical Society, March 8, 1905.

tion, and pressure on the neck, ordinarily involves the fifth and sixth roots. The characteristic paralysis therefore is of the deltoid, the biceps, and the supinators of the forearm; thus the arm hangs by the side in an attitude of inward rotation and pronation. During the period of repair, extending over several months, and which is often incomplete, accommodative retraction and contraction of the tissues take place that prevent resumption of normal attitudes when recovery is complete, and which favor greater disability if the injury to the nerves is irremediable.

In cases of obstetrical paralysis seen soon after birth, it may be noted that the tissues at the seat of the injury are often sensitive to pressure; there may be swelling at the shoulder, and passive motion of the arm causes evident discomfort. These symptoms of direct injury gradually subside; but if, meantime, the arm has been allowed to hang by the side unsupported, a very decided resistance is apparent when one attempts to rotate the humerus outward or to abduct it, even during the early months of infancy.

There is a very general impression that spontaneous recovery is the rule after obstetrical paralysis, consequently, systematic treatment for the purpose of preventing deformity is not usually employed; and, although the original helplessness gradually lessens, the comparative disability may become more marked with development.

In a characteristic case of this type, the habitual pronation of the hand and the awkwardness of the arm are very noticeable. Usually, the extremity is smaller and shorter than its fellow. The humerus is somewhat abducted on the scapula; its upper extremity projects behind and below its normal position, and there is a corresponding flattening of the tissues on the front of the joint. The deltoid is usually completely atrophied, and there is practically ankylosis at the articulation. In many instances the power of flexion of the forearm has been regained, and that of the supinators also; but this cannot be properly exercised because of the restriction of motion at the shoulder.

In these cases the deformity and disability of the arm are much more noticeable than the displacement of the humerus; but this displacement and the other restrictions to normal motion that accompany it, although secondary to the paralysis, have become of greater importance than the original lesion, since they prevent functional use, and are thus in great degree accountable for the loss of growth and the comparative uselessness of the extremity.

If the displacement of the humerus is complete, or more extreme than might be accounted for by development in the attitude of deformity, one may conclude that the dislocation and the paralysis were each the direct effect of injury at birth. In such cases the prognosis is of course much more favorable than in the preceding class. Finally, if an actual dislocation is present without history of injury or of paralysis, it may be classed as truly congenital.

In all cases of this character of whatever class, the first indication is to reduce the deformity. In cases of the third class, which, as has been stated, are by far the most common, the ultimate purpose of treatment is to overcome the inward rotation of the humerus so that the power of supination of the forearm may be utilized. In this, as in all other disabilities secondary to paralysis, the actual degree of irremediable injury to the nervous apparatus cannot be estimated until deformity and restriction of motion have been overcome. In many instances, partial, or even complete, recovery from the original paralysis may have taken place, and yet there has been no return of function because of the restraint exercised by secondary contractions and adhesions. Thus, in certain cases of this character, practical functional cure may be attained when these obstacles are removed. I mention this point particularly, in order that it may not be assumed that I regard correction of deformity as a treatment of paralysis other than in the manner indicated.

It was at one time generally believed that a large proportion of these cases were truly congenital, and that there were accompanying developmental defects that would prevent repo-

sition. Thus the treatment originally advocated by Phelps was to open the joint on the posterior aspect, and to cut away sufficient of the head of the humerus to accommodate it to the contracted capsule. It seems more rational, however, from the point of view that I have indicated, to increase the capacity of the joint rather than further diminish the size of the already atrophied head of the humerus. Afterwards, one must assure the improved position by fixing the parts for a sufficient time to permit readjustment of the tissues. In other words, the treatment should be similar to that of bloodless reduction at the hip-joint.

The child, having been anæsthetized, is brought to the edge of the table. The shoulder is grasped firmly with one hand in order to restrain the movements of the scapula, and with the other the arm is drawn upward and backward over the fulcrum of the thumb, which lies behind the joint. This, the so-called pump-handle movement, alternately relaxing and stretching the contracted parts, is carried out over and over again with slowly increasing force, the aim being to force the head of the bone forward, and thus to overcome the resistance of the anterior part of the capsule. When this has been accomplished, there is a distinct depression behind, and the head of the humerus projects in front, at a point below its proper position.

One then attempts to overcome the abduction and to force the head upward by changing the grasp on the scapula and using the thumb in the axilla as a fulcrum. When the arm can be carried across the chest to the normal degree of adduction, the final, and often most difficult, part of the process, namely, to stretch the tissues sufficiently to permit the proper degree of outward rotation, is undertaken. This is best accomplished by flexing the forearm and using this to exert leverage on the humerus, care being taken, of course, to avoid the danger of fracture. When the head of the bone has been replaced, it will often be noted that the tension on the anterior tissues causes flexion of the forearm; this must be overcome in the same manner, and, finally, the limitation to complete supina-

tion. The extremity is then fixed in the over-corrected attitude by means of a plaster bandage which includes the thorax. That is, the arm is drawn backward so that the head of the humerus is made prominent anteriorly, the forearm is flexed and turned outward to the frontal plane, while the hand is placed in extreme supination, the arm lying against the thoracic wall.

In the more extreme cases it is impracticable to complete the operation at one sitting. When, therefore, as much force has been exercised as seems wise, a plaster bandage is applied, and after an interval of two weeks the further correction is undertaken.

As has been stated, when the head of the bone is forced forward, a distinct depression and evident relaxation of the tissues is noted on the posterior aspect of the joint. The object of the fixation is to allow the contraction of the posterior wall of the capsule and the obliteration of the old articulation, consequently, the part must be fixed for a period of at least three months. When the plaster bandage is removed, the after-treatment is of great importance. This consists of daily passive forcible movements to the extreme limits in the directions formerly restricted; namely, outward rotation, backward extension, and eventually abduction of the humerus and supination and extension of the forearm. For in all these cases there is a strong tendency to a return in some degree to the original posture. When motion has become fairly free, the disabled member must be regularly exercised and re-educated in functional use. Under this treatment the weakened and almost completely atrophied muscles usually gain surprisingly in power and ability, and the longer it is continued the better will be the final result. If the deltoid muscle is completely paralyzed, one cannot expect independent movement at the shoulder, and the aim should be to gain fibrous ankylosis in the attitude of outward rotation in order to permit supination of the forearm.

To recapitulate: The essentials of successful treatment of this difficult class of cases are complete overcorrection at



FIG. 1.—The characteristic attitude of obstetrical paralysis, an attitude that causes deformity.



FIG. 2.—Subluxation of the humerus, showing the prominence of the head behind and below its normal position, and its effect upon its attitude, particularly in causing persistent supination.



FIG. 3.—The same patient eight months after treatment, showing the range of abduction and the gain in muscular development.



FIG. 4.—A case similar to that shown in Fig. 2 illustrating the improvement induced by exercise in a period of about eighteen months after operation.

the time of operation; fixation for a sufficient time to assure the stability of the new articulation by accommodative changes within and without the joint, and the persistent after-treatment, as has been described.

Although this paper is concerned primarily with displacements at the shoulder, there are other points of interest that may be mentioned briefly. For example, it is evident that this, in many instances, is one of the unnecessary deformities that might be prevented by support and by methodical passive motion of the arm during the stage of primary paralysis caused by injury at birth, or by the immediate replacement of a dislocation induced by violence at that time. It is evident, also, that this treatment should always precede the operation of nerve grafting, or other operation on the brachial plexus, for even complete restoration of the nerve supply would be of little use if function were restrained by deformity.

Finally, attention may be called to the fact that there is another class of cases in which the injury to the brachial plexus has been more severe, and in which the resulting paralysis is wide-spread. There is, as a rule, no displacement or other deformity at the shoulder, the appearance being one of helplessness rather than of contraction. In such cases other operations, such as tendon transplantation and arthrodesis, if supplemented by support, may make the useless member serviceable.